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12 November 1965

Please Reference:  
A51-65-3403

U. S. Government

Subject: Evaluation of the 4x5 Chip Processor

Gentlemen:

In response to a request from your technical personnel, we are pleased to provide the following quotation for the Performance Evaluation and Testing Program of the 4x5 Chip Processor as described per the attached program outline.

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Performance Evaluation Program - - - - -

A breakdown of anticipated costs as follows:

Engineering "B" 80 hours @  
"C" 408 hours @  
"E" 24 hours @



Engineering O/H @ 140%  
Total Engineering

Materials

Film  
Chemistry



Total Cost

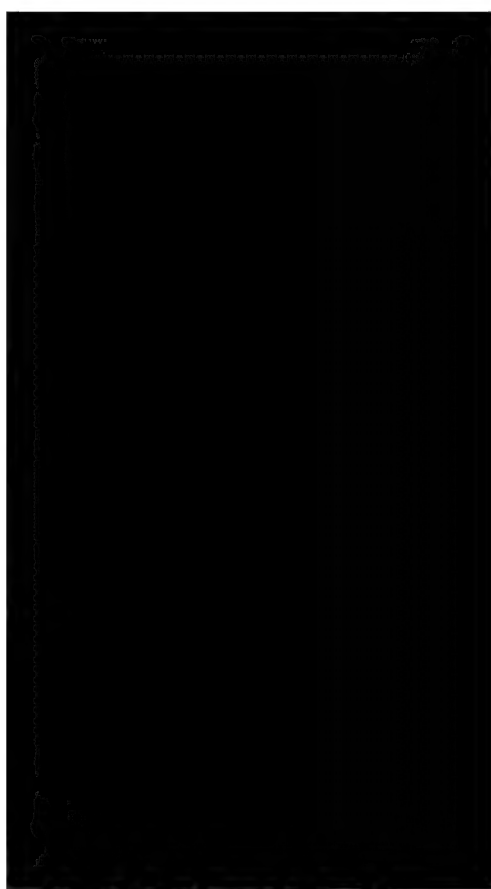
G & A 17%

Sub Total

Profit

Packaging and Shipping Charges  
Los Angeles to Washington, D.C.

TOTAL PROGRAM COSTS



continued - - -

Declass Review by NIMA/DOD

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It is estimated that the program can be completed within three months after arrival of the processor.

If you should have any questions, please do not hesitate to contact us.

Very truly yours,

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Director of Contracts

RJN:ml  
Encl.

PROPOSED  
EVALUATION PROGRAM  
FOR  
PERFORMANCE OF 4 BY 5 CHIP PROCESSOR

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November 1965



## INTRODUCTION

This document is a proposal for a program to test, evaluate, and report on the performance of a photographic processor for 4-by-5-inch film chips. The program is to be conducted in the research laboratories of the [REDACTED] The processor is to be supplied by the U. S. Government.

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### Objective.

The objective of the proposed program is to evaluate the photographic and functional performance of the 4-by 5-inch film chip processor.

### Procedure.

The program will consist of a three-phase test operation, a detailed evaluation of the processed film, and the preparation of a test report. For Phase I of the testing, the processor will be inspected and tested for conformity with design specifications and standards of good design and manufacturing practice. Phase II will consist of the preparation of exposed film chips with representative images and with sensitometric exposures. Phase III will consist of the actual processing operation. Evaluation of the processed film will consist of a detailed inspection and analysis with appropriate instruments and laboratory procedures to establish the quality of the processing. A detailed test report will then be prepared and submitted. The report will include the test records and representative samples of the processed material.

## TEST PROGRAM

### Phase I -- Initial Inspection and Checkout

Inspect and check out mechanical, electrical, and plumbing components and systems for workmanship and proper operation as follows:

- 1) Visual Inspection -- Inspect exterior and interior for quality of workmanship including necessary sturdiness, freedom from burrs, scratches, and other visible imperfections. Inspect controls and indicators for accessibility and ease of operation. Consider maintenance and servicing requirements and determine adequacy of provisions as related to frequency of requirements and type of personnel to perform maintenance. Examine provisions for installation and for plumbing and electrical connections.
- 2) Tank Filling Provisions -- Fill solution and wash tanks with water and evaluate adequacy of filling provisions.
- 3) Solution Temperature Pull-Up Time -- Set temperature control to desired representative operating temperature and energize heating system. Measure time required to bring solutions to operating temperature.
- 4) Solution Temperature Stabilization -- Use calibrated thermometer to establish solution temperature stabilization and measure final temperature. Record temperature to determine set point of heating system.
- 5) Temperature Indicator Accuracy -- Check ready-light indicator against actual solution temperature.
- 6) Drier Temperature Pull-Up Time -- Energize the drier heaters and measure time required for drier temperature to stabilize at set point of drier heater system. Record maximum drier temperature.
- 7) Power Consumption -- Measure and record electrical loads during starting and operation.

8) Water Consumption -- Measure and record water consumption during operation.

9) Drain System Adequacy -- Determine ability of drain system to carry off wash water and to drain tanks at an adequate rate.

#### Phase II -- Preparation of Test Materials

Prepare test materials as follows:

1) Film Chips, Typical Images -- Prepare exposed film chips over the full range of emulsion types and image characteristics that the processor is designed to handle. Prepare a sufficient number for an adequate test run.

2) Film Chips, Sensitometric Exposures -- Prepare film chips with sensitometric exposures including calibrated step wedges for gamma determination on representative emulsions.

3) Film Chips, Uniform Exposures -- Prepare film chips with uniform overall exposures at representative exposure levels for determining uniformity of processing.

4) Processing Solutions -- Prepare processing solutions for the various emulsions to be tested.

5) Processor Preparation -- Fill processor solution tanks and bring processor to operating temperature.

#### Phase III -- Operational Performance

Operate processor in accordance with standard practice and process exposed test film chips. Change solutions if necessary to meet requirements of different emulsions.

1) Loading and Chip Feed -- Evaluate loading and chip feed provisions for convenience and reliability.

2) Film Transport Speed Tests -- Measure chip feed system speed as related to immersion times. Repeat measurement several times during tests to check for variations. Record all measurements for evaluation of processing accuracy and repeatability.

3) Replenishment System Tests -- Measure and record replenishment rates for both developer and fixer in cubic centimeters per minute. Compare with required rates. Evaluate provisions for adjusting replenishment rates to desired rates. Evaluate stability of replenishment rates.

4) Leakage -- Inspect for evidence of leakage or spillage that might degrade processor operation.

#### EVALUATION OF PROCESSED MATERIAL

To evaluate the processed film for photographic quality, critically examine the processed film using magnifiers, a densitometer, and chemical laboratory equipment as required to determine the performance quality of the processor.

1) Light Tightness -- Examine film that has been processed with the processor in normal room light for any evidence of light leakage in the processor.

2) Uniformity of Development -- Selecting film chips that have received uniform sensitometric exposures over the picture area, measure the developed density with a densitometer for evidence of uneven development from frame to frame and edge to edge and for streaks and mottling. Record maximum and minimum densities found in areas of uniform exposures. Compare with accepted standards for uniformity of development.

3) Freedom from Physical Damage -- Examine all processed chips critically for evidence of physical damage. Check for abrasions, scratches, image distortion, emulsion frilling, mottling, creases, drying marks, and foreign matter in the emulsion.

4) Archival Quality -- Determine the residual thiosulphate content of a sufficient sampling of processed film to evaluate archival quality. Use the test procedure ASA PH 4.8, 1958.

5) Gamma -- Measure the densities of the developed sensitometric step exposures on several film chips, plot the H and D curves, and measure the gammas. Determine that the gammas are within the required range for the intended use of the film chips.

#### TEST REPORT

Examine the records of the completed tests and evaluate the performance of the processor in each item tested as compared to existing standards of performance for similar work. Evaluate the overall performance of the processor taking into account the type of work to be performed, the expected operational environment, the qualifications of the operating personnel, the service and maintenance required, and the overall operating reliability.

Prepare and submit a written report summarizing the test method, describing the preparation of the test films, and reporting the evaluation of the results and the conclusions reached. Include the test records and representative samples of the processed material in the report.